Original Article

Indian Journal of Research in Anthropology
Volume 10 Number 2, July – December 2024
DOI: http://dx.doi.org/10.21088/ijra.2454.9118.10224.3

Indigenous Techniques and Methods of Processing NTFPs: Special Reference to Bhuiyan and Juang

Digbijoy Giri

How to cite this article:

Digbijoy Giri, Indigenous Techniques and Methods of Processing NTFPs: Special Reference to Bhuiyan and Juang. Ind J Res Anthropol 2024;10(2):123-134.

Abstract

Bhuiyan Juang Pirha (BJP) in Kendujhar district is a tribal-dominated forest fringe area. Lack of agricultural land, unfertile soil, lack of irrigation and poor communication compel the local people to depend completely on the forest ecosystem for their daily needs. Collections and sale of different non-timber forest products (NTFPs) for domestic and commercial purposes are considered as important means of their livelihood. The tribal people seasonally collect various NTFPs to satisfy the needs for their food, fodder and also medicine. The present study tries to explore the importance of NTFPs on the livelihood of the tribal people in the forest fringe areas. Continuous field surveys and interviews were done with a structured questionnaire for data collection. The nature and pattern of **NTFPs** utilization by the Bhuiyan and Juanga tribes for domestic and commercial uses have been estimated indirectly. The conservation of these forest products is to be given priority in forest management. Strategically, on the basis of the information thus collected from field surveys in NTFP resources obtained in the local Sal-dominated forest ecosystem have been ranked according to their importance in tribal livelihood. Such importance has been assessed in terms of monetary value, volume of collection, availability and uses.

Keywords: NTFPs, Forest products, Bhuiyan, Juangas, Eco-system, PVTGs.

INTRODUCTION

Tribal communities with their age-old tradition and technology have been living in forests for thousands years. They have a strong conviction that the forest belongs to their ancestors who left it for their children and therefore have a full right over the forest. They exploit the forest for their living. They collect food, fodder, and fuel from the forest and make fun, feast, and festivals in the forest. The freedom they were enjoying in the forest a few decades back is no more. This has been curtailed due to the forest policies primarily for national interest. However, since time immemorial as they have been intimately associated with the forest their perception and culture are forest-oriented. The clan, lineage, family organisation, marriage, and descent rules are intimately interdependent with forest and forest products, including vegetation

Author's Affiliation: Joint Director, Directorate of Census Operations, Salt Lake, Kolkata 700106, West Bengal, India.

Corresponding Author: Digbijoy Giri, Joint Director, Directorate of Census Operations, Salt Lake, Kolkata 700106, West Bengal, India.

E-mail: dr.dgiri69@gmail.com

Received on: 26.09.2024 **Accepted on:** 13.11.2024

This work is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0.

and animals. They have their worldview and creative mind, technology, taboos and totems, art and artefacts, work and worship, medicine and morals, belief systems, myths and legends, rites and ritual practices, life and living and all other socio-cultural transactions are the function of their forest interactions. Sacred groves and the abode of deities and spirits are the sacred spots for them. They treat cultivable land and adjacent forest as highly venerated. Differential forest dependencies and food habits indicate the differentiation in cultural practices and patterns. Tribal women and children make a portion of their living by collection of minor forest products (MFPs) from forest. In spite of the large-scale deforestation due to development projects and banning of shifting cultivation, particularly in tribal dominated areas, the tribal people have always been maintaining a close relationship with the forest. Even today many tribal communities are in primitive form of economy, mainly due to non- adoption of modern innovations and non-specialization. **Since**, there is symbiotic relationship between tribe and forest, their economy is largely dependent on both agriculture and forest. The minor forest products they collect meet their food requirements and also supplement their annual income. It is also believed that during the period of scarcity, the forest provides edible roots and shoots to them. Thus, the tribal economy can be said to comprise of agriculture and forestry to meet their daily requirements of food. The impact of depletion of resources are more glaringly visible in the case of forest density. The change in the resource base generates a kind of stress in the community and there has been a search for alternatives and coping mechanisms. Thus, it leads to a change in perception of resources. From an ecological perspective, the studies on tribal communities and forests are not enough. Specifically, the symbiotic relationships of the tribal with that of forest resources in respect to their indigenous Knowledge and perception of the environment are almost non-available in the context of Primitive Tribal Groups **(PTGs)** now known as Particular Vulnerable Tribal Groups (PVTGs). However, few studies so far undertaken by scholars and Government Departments, specifically in the context of tribes of Odisha, partially recognize the interdependent characters of both forest and tribal people. From cursory observations, it seems the nature of dependency of the tribal people on the forest reflects the character of sustainability. These are yet to be documented in the changing scenario through proper investigation and research. During British period in India forest resources, like timber and timber products, were known as major and other forest products are known as minor forest produce (MFP) which has since recently known as Non-Timber Forest Produce (NTFP), (Hartman, 1976).[11] Recent literature on forests and tribes reflects the potential dependencies in the area of economy and socio-cultural life (Peter *et al.*, **1989**;[17] Beer and Mc Dermot, 1989;[1] Campbell, 1993;[2] Malhotra *et al.*,1992).[13] The community use and community value of the forest have been constantly highlighted by the International Tropical Timber Organization (ITTO) since 1988. Fundamental research over the world on the forest has only highlighted the economic and employment aspects (FAO, 1989; IDRC, 1980; Weinstock, 1983).[3-12-22] Few studies have dealt with Government interventions and Socio-Cultural issues (Tiwari and Campbell, 1990)[21] and the management of forest resources (Campbell, 1993).[2] The commercial viability of forest species in our country reveals close linkages between tribal people and forest on the one hand and the potency for the prosperity from different trades at local, regional and state levels on the other (Roy Burman, 1982).[20] The studies made by Pattnaik *et al.* (1996)[17] have discussed the possible conservation techniques of the native tribes of the Chandrapur and Deomali hills of Koraput district. Patnaik (1996)[17] further elaborates on the indigenous methods of value addition and marketing of forest products. Padhi (1994)[16] has studied the status of forest coverage of Orissa, tribes depending on forest produces, economic importance and possible use of various forest produces. Fernades *et al.* (1988)[6] and Das (1996) have highlighted the participation of the tribal people in forest management, pattern of collection of forest produce, and the differential dependency of various economic groups concerning their consumption and sale. Giri (2017) highlighted forest issues, the role of government, various processing technologies and the reasons for the failure of Government and Non-Government institutions to protect the interests of the tribal people. Mallik (1994)[15] in the selected pockets of Orissa studied the issues on potential procurement and marketing of selected forest produces finds that procurement of N.T.F. Ps provides both employment and income, with more employment to women. He has studied the dominant role of private intermediaries in the procurement and marketing networks of forest produce. Mallik and Panigrahi (1998)[14] studied the N.T.F.P. Collection: Benefits and Management in selected pockets of Orissa. They highlighted the potentiality, value addition, and marketing of forest products by the tribe. Various studies on forest resources, tribal

people and their interrelationship have covered the issues of collection and sale of NTFPs; income and employment potential; forest depletion and people's dependency on it; multifarious community use and community values of NTFPs; the potential of value addition on different types of forest resources and exploitation and deprivation of tribal people by middlemen, private traders and businessmen. The studies on the indigenous skills and technologies of the tribals towards the forest, and their perception and attitudes are almost non-existent.

Objective: To document the Indigenous technology and methods for processing the non-Timber Forest Produces (NTFPs) in the area. Many of the forest products are still unknown to the larger society due to a lack of knowledge about their utility and methods of processing and storing. Here, an attempt is being made to present an illustrative overview of various methods of processing of NTFPs. Further, it has been highlighted the use of various methods of indigenous techniques to cover consumable items and make market friendly through various value addition**.** It also dealt with socio-economic and cultural values associated with the NTFPs. It has been identified the specific NTFPs and their processing technology by applying Indigenous knowledge.

Methodology: The study area has been taken the Bhuiyan-Juanga *Pirha* (BJP) of Kendujhar District of Odisha. Bhuiyan and Juang are the two Particular Vulnerable Tribal Groups (PVTGs) of Odisha, residing and highest numbers mainly concentrated in the district. The BJP area comes under the Banspal Development block. For data collection 6 sample villages were taken, 3 from Bhuiyan *Pirha* and 3 from Juanga *pirha* under two gram panchayats Suakati and Gonasika respectively. The field area selected for the present work was the villages amidst forest ambience. Six villages under the Gonasika and Suakati Gram panchayats core study area were periodically visited to cover up the annual cycle of livelihood activities between January 2022 and December 2023 to document and cross-check of the collected data. Key informants were selected purposely from both the *pirhas* (Bhuiyan and Juanga). Interviews and observation were the main tools used during fieldwork. Three villages namely Tentuli, Talakainsari and Suakati of the Bhuiyan Tribe; three villages Guptaganga, Talabaitarani and Gonsika of Juang tribe were purposely selected for depth study.

Sl.No	Name of the gram panchayats (HHs)	Names of the village	Distance (Km) from district HQ	Household covered	Distance (Km) from district HQ	Population (As per Census 2011)			Total Scheduled Tribe (As per Census 2011
						Total	Male	Female	
1	Suakati (132)	Suakati	17	43	17	3764	1777	1987	1882
2		Talakainsari	14	51	14	622	321	301	514
3		Tentuli	18	38	18	1995	975	1020	1546
4	Gonasika (139)	Guptaganga	38	57	38	610	324	286	424
5		Talabaitarani	42	33	42	206	99	107	51
6		Gonasika	35	49	35	1459	797	662	1124

The sample villages for study have been taken close to the urban setting in Suakati gram Panchayat and quite interior as well as traditional in Gonasika Grampanchayat of the Banspal block of Kendujhar District. Gonasika and Suakati village have good exposer with non-tribal communities and marketing facilities available with Keojhar town, the district headquarter for Non-timber forest produces (NTFPs). Checking, rechecking and cross-checking of data were a regular feature to determine the validity reliability and necessary of information. Emic views are been recorded and interpreted for the empirical study. Here the name of the tribes *Bhuiyan* and *Juanga* the actual pronounces by the themselves are mentioned as the synonyms of Bhuyan, Bhuiya and Juang (Giri)[9]Scheduled tribes notified by Government of India(Central List of STs & SCs Slno.6 and 26 of Odisha).

Result & Discussion: The NTFP items taken for value addition vary in number both in Juanga *Pirha* and Bhuiyan *Pirha* due to various reasons, viz., market demand, buyers' choice and preference and price level. The knowledge and awareness of the tribal sellers are equally important in value addition. Due to a lack of scientific processing knowledge,

the forest dwellers of Bhuiyan *Pirha* largely sell surplus NTFP items in raw form immediately after collection without any value addition. The entry of outsiders into Bhuiyan *Pirha* for various purposes like employment, business, wage-earning, etc. have created an unnatural demand for immediate consumption of certain forest products like Mango, Jack fruits, Mushrooms etc. The situation in *Juanga Pirha* is comparatively different due to its inaccessible location, poor marketing channels, less demand for immediate consumption due to less infiltration of outsiders into the area etc. This leads the local people to go for value addition of certain perishable products for preservation for future consumption and for securing more prices through sale. Due to more production and collection of certain NTFPs like mango, jackfruits etc., people are compelled to process these items. The methods and techniques used for processing different NTFPs vary from product to product and also in few cases from *Pirha* to *Pirha* since Bhuiyans and Juangs are dissimilar tribes who use forest produces differently. There is a total of 21 of NTFP items which are processed for value addition for commercial purposes, and for home consumption. The number of such items in Bhuiyan *Pirha* is 12 and in Juanga *Pirha* are 20. The items of NTFP include roots, tubers, leaves, flowers, fruits, seeds, bark, fibres, gums, mushrooms, and honey. An overall picture of different NTFP items taken for value addition is mentioned and highlighted. Looking into the use pattern, certain NTFPs are classified as purely consumption items, purely marketing items or both for consumption and marketing. As regard the marketing of NTFPs, questions were asked **whether they withhold the selling of NTFPs for future**. It is reported that more than 84 and 40 per cent of households kept NTFPs in Bhuiyan and Juanga *Pirha* respectively and withhold the disposal of their NTFP items, mainly for processing in Bhuiyan *Pirha* (15%), whereas it is 60.00 per cent in Juanga *Pirha*. A detailed list of such items used for various purposes is given (*Table 2.1*). Here an attempt is made to describe a few products as regards their processing methods, techniques used, and inputs required in the processing. The data on value addition of NTFP items are collected through in-depth discussions with the respondents and observations at the time of their processing.

Table 1: Distribution of NTFPs in the study area.

	NTFP Items	Variety	Botanical Name
Bhuiyan Pirha	Roots	1. Patalagaruda	Rauwolfia serpentine
	Leaves	2. Siali	Bauhinia vahli
		3. Sal	Shorea robusta
	Flowers	4. Mahua	Madhuka longifolia
		5. Girli	Indogofera cassioides
	Fruits	6. Char	Buchananiu latifolia
		7. Mahua	Bassia latifolia
		8. Mango	Magifera indica
		9. Harida	Terminalia chebula
	Seeds	10. Chara	Buchanania latifolia
		11. Kusuma	Scheleichera oleosa
		12. Mahua	Bassia latifolia
	Honey	Baghua,	–
		Dala	–
Juanga Pirha	Roots	1. Patalagaruda	Rauwolfia serpentine
	Leaves	2. Padma Chakra	
		3. Siali	Bauhinia vauhli
		4. Sal	Shorea robusta
		5. Mahua	Madhuka longifolia
		6. Girli	Indogofera cassioides
		7. Char	Buchananiu latifolia

NTFP Items	Variety	Botanical Name
	8. Mahua	Bassia latifolia
	9. Anla	Emblica officinalis
	10. Tamarind	Tamarindus indica
	11. Mango	Mangifera indica
	12. Harida	Terminalia chebula
	13. Bahada	Terminalia bellerica
Tubers	14. Mandei Alu	–
	15. Pita Alu	Dioscorea wallichi
Seeds	16. Chara	Buchanania latifolia
	17. Kusum	Scheleichera oleosa
	18. Sal	Shorea robusta
Barks	19. Khandakhai	–
Fibers	20. Siali	Bauhinia vauhli
	Khajuri (Palm tree)	–
Mushroom	–	–
Honey	Baghua	–
	Saptapheni	–
	Nikti	–

Mahua Flower: (Madhuka Longifolia): *Mahua* (*Madhuka longifolia*) tree provides flower, fruits (widely used by the tribals) as consumable items. It is plentily available in both the *Pirha* during March and April and continues for a maximum period of 20 to 30 days. *Mahua* flower due to its alcoholic quality carries cultural and religious importance in the life process of both Bhuiyan and Juanga. It is also used as a food material due to rich calorie content (Gopalan)[10]. Such trees in Juanga *Pirha* are owned community wise whereas it is in the process of change towards individual ownership in Bhuiyan *Pirha*. Since the collection period of *mahua* flower lasts only for a few days, all members of the family go out to collect the same from very early in the morning till mid-day. However, depending on the quantity available, distance covered and persons involved, this varies from village to village. During this peak period even, relatives from neighbouring villages are also invited to help in the process of collection.

As regard to process of mahua almost 60 per cent of HHs in Bhuiyan *Pirha* do it, whereas in Juanga *Pirha* it is only less than 20 per cent. After collection, the raw flowers are dried in hot sun for 3 to 4 days till they become light green and then turn reddish. To separate the petal from the *Mahua* flower the villagers pound the flowers to separate both. The flower are used for various purposes like liquor preparation, and consumption in the form of cakes. As regard to the disposal of *mahua* flower, petty traders as well as middlemen, play a major role. The *Panas*, (belonging to a SC community) purchase and store it for future liquor production. This purchase and sale are purely informal in which the buyers dictate the terms of price. Since the tribal need money, they are forced to sell at a lower price. Even in rare cases the primary collectors, particularly the tribals, are not able to store it to sell in future. During the post-harvest period for few days the tribals brew liquor from this flower and consume the same.

The Bhuiyans (22%) prepare liquor in a very rudimentary form known as Vaporization method. They keep the dried mahua flowers in a big container steeped in water for 2 to 3 days with a certain specific ratio. They also add one handful of salt and around 250 gms of molasses to every 1 kg. of *mahua* under process. After fermentation they put that container on an oven, cover the pot and link it through a cylinder like bamboo to another pot kept just below. The vapour coming out from the first pot is stored in the second pot normally kept in a damp place mainly to cool down and turn the vapour into water. The rest 77 per cent of Bhuiyan use the flower as a food item in boiled form, whereas all the HHs in Juanga *Pirha* use mahua flower as food. The caste groups collect these mahua for liquor preparation and sale. Since further processing is highly technical (also not known to them) the primary collectors are

constrained to process it with various traditional crude methods.

Introduction of new technologies for extracting oil from the *mahula* seed can be helpful in producing bio-degradable manures useful for crops. The surplus *Mahua* flowers and seeds are sold which have multifarious uses, viz., to produce soap, refine oil, etc. Thus, one can say that the *mahua* flower is a major support system in the economy, social and cultural life of the native people. Looking at the situation to keep the interest of the forest-dwellers, their indigenous skill can be updated through proper planning and providing infrastructure support, so that, apart from oil extraction, it can be used as a consumable item in other forms at the village level. Again, since *mahua* provides a major source of earning in various forms to a large chunk of people, government may go in for plantation of mahua trees in order to maintain regeneration and continual supply of *mahua* to the people. *Mahua* flower has a lot of nutritious contents and acts as the main source of vitamin necessary for survival.

Mango: Mango is a major seasonal source of food for the villagers in various forms. That is why it is known as the nectar of earth and is popular for its rich delicious qualities. Availability of mango plentily in both the *Pirha* has made people to use it in various forms. As regards processing of mango, almost 84 per cent HHs process it in Bhuiyan *Pirha* whereas it is almost 80.70 per cent in Juanga *Pirha*. Almost all the households prepare *ambasada* or jelly in both the *Pirha*, whereas only 13 and 32 per cent of Households(HHs) of Bhuiyan and Juanga prepare *ambula* dried and salted mango pieces respectively. The tender mangoes are very much in demand at the local market, whereas the ripe mangoes as perishable commodities do not fetch much income in Juanga *Pirha*, in particular. Many people sell ripe mangoes directly and also extract juice through their local methods of squeezing and pressing by hand. The mango pulp is used to prepare *ambasada* or jelly by drying the pulp on the mat and keep that to dry up for few days. They cut the big pieces of jelly into small size and sell that to outsiders. Tender mangoes are also cut into small pieces, dried up and prepared for *ambula* (salted and dried mango pieces). These dried mangoes are also sometimes powdered, known as *amchur* (pasturised mango). The tribals normally keep some out of this for themselves and sell the surplus to outsiders.

Mango Kernel: While taking out the juice of ripe mango both Bhuiyans and Juangas store the kernels for future consumption. The mango kernel is the seed inside the mango. They clean the kernels with water, dry them, and press each to divide them into pieces to get the kernel. It has high utility in the form of protein content and commercial value. It is a source of oil which carries 6 to 14 per cent fat content. The fat includes desaturated (30 to 45%) triglycerides (Gopalan)[10]. As a result, it creates market demand for soap-making and preparation of vanaspati. Apart from this, the tribals powder the inner kernel, which they store to meet their food requirement during the lean season. The dried kernel powder is boiled and used to prepare gruel for consumption by adding salt. During the preparation of powder some people also fry the inner kernel to make powder which comes around one-fourth of the total mango weight. Apart from keeping for home consumption both the communities also sell these kernels to outside customers. The procurement of the kernel is very unsystematic. Both the tribal groupsTribal Development Cooperative Corporation (TDCC) does not express its willingness to enter into interior areas for collection of the same due to various reasons.

As regard marketing in Odisha, only one single agency named Utkal Forest Products Ltd. (UFP) has been given the license for collecting mango kernels in the tribal areas. The price fixed by UFP is sort of an imposition on the forest dwellers. The primary collectors neither object to it nor hesitate to accept it at the time of disposal. Since the collection of such products is not regular from the interior pockets, many times the villagers just sell the kernels at a very throw away price.

Sal Seed: *Sal* seed, in tribal economy, equally plays a major role like other forest products. It is food stuff for them. The yield is not uniform. As a result, the collection always follows much below the potentials due to various factors. Still it has its importance in varying degrees depending on their processed or unprocessed form.

Sal flower blossom and seed formation take place in the months of February and March, respectively. The peculiarity with the *Sal* seeds is that in every seven years or so a very good crop comes. The collection of *Sal* seeds is undertaken by all members of a family, particularly by women and children. It is a belief among the forest dwellers that if the *Sal* seeds are collected after June then the quality deteriorates because seeds are affected by monsoon. After the collection seeds are dried properly and pods are separated from the seeds. Odisha Forest Development Corporation (OFDC) and Tribal Development Cooperative Corporation (TDCC) are the authorized agencies to purchase

these seeds directly. However, the networking of agents for collection adopted by TDCC and OFDC creates a lot of problems for the primary collectors.

As regards extraction of *Sal* oil, the villagers largely follow their indigenous method, which is crude by nature. They extract oil for self-consumption and the rest seeds are sold in the market. The forest dweller's extraction of fat from *sal* seed is about 3 percent of the total HHs in Juanga area but this is recorded to 30 percent in the Bhuiyan *Pirha*. *Sal* seed butter, *sal* cake, chocolate etc., carry high protein and calorie. These items are much in demand in the market.

Tamarind (Tamarindus Indica): Tamarind is locally known as *imli or tentuli*. It is also an important forest product which supports the livelihood of many of the tribals. *Imli* is available during the month of February and March and may continue for a maximum period of another 15 days. It has potential to secure a wide market even if it is processed at the level of primary collectors. It is available in the forest as well as in the outskirts of villages which are traditionally treated as the common property of the village. However, now-a-day in Bhuiyan *Pirha* some people have started growing these trees for future consumption. Collection of *imli* in its ripe stage is a labour intensive work and needs two to three labourers at a time. It is plucked either by climbing the tree or with the help of a long bamboo. The nature of ownership of the tree provides scope for many to collect jointly and distribute equally among the members. This varies from village to village depending on the availability of quantity of *imli* and the people engaged in collection.

Processing of *imli* does not involve much skill. The de-seeding and de-threading and removal of hard cell are done by women. They also simply remove the outer round of tamarind stuff which is meant for marketing. The price is less in case of un-seeded *imli*. The tamarind seeds are also sold in the market which fetches a lucrative price. It is gathered that the seeds are also sold to the wholesale dealers which are used for making starch and glue.

Fibre: Siali fibre is used for making rope for various purposes, viz., thatching of house roofs, making slings (Sika), tether (*pagha*) for cattle, buffaloes, and for drawing water from dug well etc. Compared to Bhuiyan *Pirha* plants of such fibres are available in the Juanga *Pirha*. But marketing facilities of fiber products are much less in Juang *Pirha.* Collection of *siali* creeper is mainly done by the male members who collect it during the rainy season. It is available in forest and communally owned places. However, it is collected individually. While processing, the villagers dip these fibers in water for few days till the material becomes soft. Then they take out and hammer the fibers till they are separated from one another like a tuft of hair. Apart from sale, the villagers mainly prepare ropes for their own use. Processing, goods making and marketing can be improved through little modernization of their traditional technology in order to make the products market-friendly.

Amla (Emblica officinalis): *Amla* (*Emblica officinalis*) trees are available in deep forests. Such trees yield amla fruits during the winter season. The trees are communally owned but collection may be done individually and distributed equally if jointly plucked. Both males and female participate in the collection of amla. This product has ready market value and do not need any processing for fetching higher price.

The product once collected means it has to be sold within few days even at lower price. As gathered, amla is also used as an ingredient in the preparation of medicines in which the primary collectors do not get any benefit. The villagers also eat few amla as raw with knowledge that this provides vitamins and helps their body. *Amlas* are also processed by adding salt and preserved for future consumption as a food item after drying in the Sun.

Honey: Availability of honey is decreasing day by day. It is usually available during flowering season that is late summer. Honeycombs are generally found in dense forest on specific big trees having high branches and receiving sun rays. The honey is collected individually in small groups, who are mainly relatives. The separation of wax from honey is carried out by villagers by placing the honeycomb on boiled water and then cooling it. Apart from its availability in deep forest, in Bhuiyan *Pirha* some villagers have started cultivating honey by rearing honey bees in honey box. They sell honey to the agents either at village level or to distant agents coming from nearby urban centres. Normally they do not store for future and sell away for higher prices.

Kusum (Schleichera Trijula): *Kusum* tree is very commonly available in the Swidden land. *Kusum* seeds are available during the months of May and June. As regards the ownership of Kusum trees, villagers have individual rights over them. The seeds are collected for a period of two months. In the collection and processing, female participation is more than male participation. Male members climb the trees and cut the branches containing mature fruits and women folk gather and equally

distribute seeds among the gatherers, who are mainly kin members. As regards processing, the villagers first dry the seeds properly, then grind them, and thereafter boil the material in a container and extract oil. This is a very crude processing method. They keep the seeds under pressure for a period almost half day for squeezing oil. Apart from keeping for self consumption, few households also sell the oil in the weekly market at a nominal price. However, they use this oil throughout the year.

Char Seed (Bunchanaria Lanzan): The *char* tree is bushy type and it yields *char* fruits from which seeds are taken out. *Char-seeds* are collected during the months of May and June. As regards its collection, women take active participation. After collection, seeds are dried in the sun properly and then Kernel is taken out by gently hammering with a beating stone. This work is normally done by old women. Almost 95 percent of the processed seeds are exchanged at the weekly market against salt. One kg of processed *char* seed costs Rs.350/- which is exchanged with minimum 50 and maximum 70 kgs. of salt. Exchange of salt is very rare now a days. Similarly, one kg of unprocessed seed costs Rs.50/- The seeds are even collected at a premature stage and, as a result, lots of seeds are found wasted. This is mainly due to competition for collection among the villagers now-a-days. Since this seed has high market value outside the state, during the season many local as well as outside agents are found busy to motivate the villagers to sell even the unprocessed seeds. In spite of the experience gained by the forest dwellers over the years, they are always being exploited by the traders while selling the products in several ways, namely in weight and measures, price fixation etc.

Tubers: People in both Juang *Pirha* and Bhuiyan *Pirha* regularly collect a number of tubers for various purposes. Day by day the variety and quantity of tubers are decreasing either due to extinction or over exploitation. Some of the tubers commonly found in both the *Pirhas* are *Bayan, Kalei, Jarai, Tanautijung, Jaljung,* etc., which are said to be tasteful and nutritious. Some of the tubers are deep rooted and big in size, whereas a few others are small in size. As regards processing is concerned, few tubers are cut into small pieces and dried for preservation for future. Some of the tubers are boiled to take out the bitterness before consumption. The boiled tubers are put in a bamboo container and kept in the stream overnight for washing out the bitterness of the tubers. Purchase and sale of tubers in the local market are carried out only among the forest dwellers.

Mushroom: Mushrooms are available during the months of July and October. Many wild varieties of mushrooms are collected and consumed. Some of them are *bali, bihuduni, Khuda, Phutkoli, bidana, parabani.* Compared to Bhuiyan *Pirha* quite a good number of mushrooms is available in Juanga *Pirha*. Since mushrooms are perishable commodities by nature, the villagers either immediately try to sell away or consume the same. As Juanga *Pirha* does not have market facilities for disposal, people largely consume these mushrooms. Some of the mushroom collections are dried and kept in powder form for future consumption. In Bhuiyan *Pirha* due to easy access into market, collectors are able to dispose of more mushrooms as compared to the quantity they consume. Among all the varieties of mushrooms *Khatagadu* and *rutuka* are considered more tasteful and nutritious. Mushroom curry in lean season is considered a prestigious curry. During this period almost all the children and women go out for collection of mushrooms for self-consumption. Perhaps this gives them more protein and calories. As the collection continues for a very short period the villagers have a latent competition among them.

MEDICINAL PLANTS

Apamaranga (Achyaranthus aspera): It is a bushy herb known as common weed of the waste land. A piece of root is masticated to cure toothache. The juice of the plant added with milk is given twice a day for curing piles and renal bleeding. The local medicine man collects the roots of this plant, dries and preserves for sale.

Ankala (Alangium salvifolium): This is a woody shrub available in the forest. Its leaves are collected and packed with a piece of fine cloth and then put in fermented rice water for some time which is used to cure conjuctivitis. Similarly, the liquid substance is used as ear drop. Ankala shrubs for this purpose are collected only on the first calendar day of the bright fortnight, particularly during night time. They store the withered plant for personal use as well as for sale.

Bhuin Limba (Andro graphis): This is a kind of herb which is collected during flowering as well as at the fruit bearing stage. Its leaves are crushed along with turmeric powder and applied on itching spots and other skin disease. Again, the leaves are dried up and sold to the local quacks for further medicinal purposes.

Satabari (Asparagus ralemosus): This is one of the medicinal plants available in the forest. A

piece of root along with a piece of its branch is grinded and the paste is taken orally by women for regulating their menstrual cycle and checking excess bleeding. Satabari roots are collected for this purpose on new moon day by the priest.

Neem (Azadirachta indica): Neem is an important plant from the point of view of its use in villages. In every village there are few neem trees which provide the village with healthy air and atmosphere. Its juice is used for treatment of several diseases. Its flowers are eaten for cure of worm infestation and skin diseases. Oil is extracted from its seeds which has tremendous medicinal value.

Sunari (Cassia fistula): *Sunari* tree plays a very important role in day to day health and hygiene of the villagers. The bark of the tree is collected and its juice is applied on the forehead of the patient for cure of headache. Ground bark is applied on the swelling part of man or animal for cure of pain and swelling. The barks are dried and stored for use as and when necessary.

Hadabhanga Lata (Clasus Quardrungulu Ris): The very name signifies the purpose of this creeper. A type of paste is prepared from this plant along with millet or ragi. The paste is baked over a hot pan which is plastered over joints to cure rheumatic pains and straighten the broken bones. Since this creeper is scantily available, the collectors sometimes compete with each other to collect it. They also dry this creeper and store it for future use and for sale also to the agents and quacks.

Patalagaruda (Rauvoleia serpentina): It is a belief that the *patalagaruda* roots are available inside the soil of deeper forests. This is a rare plant occasionally available in the deep forest. A piece of root is rubbed against a piece of stone and the juice is applied on the wound and taken orally which cures snake bite and stings of scorpion. The root of the plant is pounded and diluted in water for use. The paste is sometimes taken orally for cure of stomach pain. Five to ten ground black pepper mixed with its juice are taken orally for relief from post-menstrual pain.

Padma Chakra: The *Padma Chakra* is also called *mushakani chera* or root of *padmachakra creeper*. It is available in the forest throughout the year, particularly in *Juanga Pirha.* The root of this plant is used to prepare *handia* (homemade alcoholic beverage) by the villagers. By this the rice gets fermented and brewed as liquor. Though it has a great demand from outsiders for its medicinal value, the villagers rarely sell it. The medicinal use of this product is normally done outside the region, which is not known to the villagers. During the months from October to March women collect this. Many villagers also sell these roots in local weekly market at a very cheaper price of ₹ 50/- per bundle (in 2022).

CONCLUSION

One of the major problems for management of non-timber forest produces in the country is the absence of suitable marketing infrastructure for these products. Most of these products are either utilized locally by the tribals or sold in the markets for which no suitable marketing infrastructure is available. The tribals and other villages are compelled to sell the products to local traders at very cheap rates. The tribals do not know the exact value of the products and lack of the knowledge of physical measurement. Hence the development of marketing facilities will help in getting the remunerative price to the tribals which will help in larger collection and greater out turn of various NTFPs found in the forests. A large number of NTFPs are marketed every year. Some of them are also exported outside the country. These products hold an important place not only in the home but also in international markets.at the end the study includes that a peoples' friendly as well as market friendly policy frame should be formulated by the government on a priority basis. Besides tribal should be granted full rights over the NTFPs. The government should formulate and implement definite rules in respect of collection and sale of NTFPs. The price of NTFPs should be fixed by the Government keeping in view the minimum wage rate prevailing in the state. Adequate representatives of tribal in the price fixation in no way should be depressed by small scale and cottage industry. Once the forest laws and procedures and amended or modified and simplified. Forest Right Act 2006 (FRA) may be followed strictly. It is hope that the tribal could comprehend them easily. The action-oriented policy strategy needs to be formulated and implemented with utmost care and periodic evaluation, so the forest dwellers are not thrown to severe vulnerability as well as deforestation causes serious natural disasters. The local and traditional knowledge towards forests deteriorating day by day due to the scanty availability of NTFPs. Maximum availability of NTFPs will provide to the Juangs and Bhuiyan more and more opportunities to use their indigenous technique to process the available NTFPs around them to better livelihood on part of their life.

Annexure 1: Nutritive value of fruits

	Energy (Kcals)	Moisture (g)	Protein (g)	Fat (g)	Mineral (g)	Fibre (g)	Carbohy drates(g)	Calcium (mg)	Phosphorus (mg)	Iron (mg)
Ambada	48	90	1	3	0	1	4	36	11	4
Amla	58	82	0	0	0	3	14	50	20	1
Apple	59	85	0	0	0	1	13	10	14	1
Apricotfresh	53	85	1	0	1	1	12	20	25	2
Apricotdry	306	19	2	1	3	2	73	110	70	5
Avacodo	215	74	2	23	1	-	1	10	80	1
Baelfruit	137	61	2	0	2	3	32	85	50	1
Bananaripe	116	70	1	0	1	0	27	17	36	0
Banyantreefigs	72	74	2	2	2	8	12	364	43	-
Bilimbi	19	94	0	0	0	1	3	15	10	1
Breadfruit	71	79	1	0	1	2	16	40	30	0
Bullockheart	70	77	1	0	1	5	16	10	10	1
Capegooseberry	53	83	2	0	1	3	11	10	67	2
Cashewfruit	51	86	0	0	0	1	12	10	10	0
Cherries, red	64	83	1	0	1	0	14	24	25	0
Currants, black	316	18	3	0	2	1	75	130	110	8
Datesfresh	144	59	1	0	1	4	34	22	38	1
Datesdried	617	15	2	0	2	4	76	120	50	7
Grapepalegreen	71	79	0	0	1	3	16	20	30	0
Grapefruit seedless	45	88	1	0	0	0	10	30	30	0
Grapefruit triumph	32	92	1	0	0	0	7	20	20	0
Grapesblue variety	58	82	1	0	1	3	13	20	23	0
Guava,country	51	82	1	0	1	5	11	10	28	0
Guava,hill	38	85	0	0	1	5	9	50	20	1
Jackfruit	88	76	2	0	1	1	20	20	41	0
Jambufruit	62	84	1	0	0	1	14	15	15	0
Korukkpalli	78	79	3	0	1	1	16	14	49	1
Lakuch	66	82	1	1	1	2	13	50	20	0
Lemon	57	85	1	1	0	2	11	70	10	0
Lemonsweet	35	90	1	0	0	0	7	30	20	1
Figs	37	88	1	0	1	2	8	80	30	1
Lichi	61	84	1	0	0	0	14	10	35	1
Lime	59	85	1	1	1	1	11	90	20	0

Lime,sweet malta	36	90	1	0	0	1	8	30	20	1
Loquat	43	88	1	0	0	1	10	30	20	1
Mahua,ripe	111	74	1	2	1	0	23	45	22	0
Mango	74	81	1	0	0	1	17	14	16	1
Mangosteen	60	85	1	0	0	0	14	10	20	0
Melon,musk	17	95	0	0	0	0	3	32	14	1
Melon,water	16	96	0	0	0	0	3	11	12	8
Mulberry	49	86	1	0	1	1	10	70	30	2
Orange	48	88	1	0	0	0	11	26	20	0
Orangejuice	9	98	0	0	0	0	2	5	9	1
Palmyrafruit ripe	87	77	1	0	1	0	21	9	33	-
Papaya	32	91	1	0	0	1	7	17	13	0
Passionfruit	54	76	1	0	1	10	12	10	60	2
Passionfruit juice	37	89	1	0	1	1	8	10	30	1
Peaches	50	86	1	0	1	1	10	15	41	2
Pears	52	86	1	0	0	1	12	8	15	0
Persimmon	76	80	1	0	0	1	18	15	10	0
Phalsa	72	81	1	1	1	1	15	129	39	3
Pineapple	46	88	0	0	0	0	11	20	9	2
Plum	52	87	1	0	0	0	11	10	12	1
Pomegranate	65	78	2	0	1	5	14	10	70	2
Prunes	56	8	0	0	1	0	13	10	18	-
Pummelo	44	88	1	0	0	1	10	30	30	0
Quince	50	86	0	0	0	2	12	20	10	0
Raisins	308	20	2	0	2	1	75	87	80	8
Raspberry	56	85	1	1	1	1	12	40	110	2
Roseapple	39	89	1	0	0	1	8	10	30	0
Sapota	98	74	1	1	0	3	21	28	27	1
Seethaphal	104	70	2	0	1	3	23	17	47	4
Strawberry	44	88	1	0	0	1	10	30	30	2
Tomato,ripe	20	94	1	0	0	1	4	48	20	1
Woodapple	134	64	7	4	2	5	18	130	110	0
Zizyphus	74	82	1	0	0	0	17	4	9	0

Source: Gopalan. C, Rama Sastri B.V. and Balasubramanian, S.C., 2004, Nutritive Value of Indian Foods, National Institute of Nutrition, ICMR, Hyderabad.

REFERENCES

1. Beer, J.H. and Dermott, Mc. (1989) Economic value of Non-Timber Forest Products in South West Asia; Council for the International Union of the Conservation of Nature The Netherlands.
2. Campbel. J.Y (1993); Changing objectives. New Products, and Management
3. F.A.O (1989) Household Food Security and Forestry. An Analysis of Socio-Economic Issues. Rome.
4. F.A.O. (1995b); Summary of Recommendations in Report on the expert consultation on Non-wood Forest Products; Yogykarta, Indonesia, NWFP, 3, FAO, Rome.
5. Fernades, W. (1996); Drafting A Peoples Forest Bill: The Forest Dweller-Social Activist. Alternative; I.S.I., New Delhi.
6. Fernades, W. Menon, G. and Viegas, R. (1988); Forests. Environment and Tribal Economy: Deforestation. Improvement and Marginalisation in Orissa; I.S.I., New Delhi.
7. Fernades, W. et.al. (1985) Forest Environment and Forest Dwellers Economy in Chatishgarh: A Report of Deforestation. Marginalisation and Search For Alternatives. I.S.I, New Delhi.
8. Giri, D.B. (2004): Juanga; In Ethnographic Atlas of Indian Tribes, Discovery publishing house, New Delhi. PC Mehta (ed)
9. Giri, Digbijoy (2017): Indigenous Resource Taxonomy, Knowledge and Culture: Bookwell, New Delhi.
10. Gopalan. C, Rama Sastri B.V. and Balasubramanian, S.C., 2004, Nutritive Value of Indian Foods, National Institute of Nutrition, ICMR, Hyderabad.
11. Hartman, R. (1976); The Harvesting Decision when a Standing Forest Has Value; Economic Inquiry.
12. I.D.R.C. (1980). Rattan: A Report of a Workshop held in Singapore, Ottawa, Canada.
13. Malhotra, K. C. (1992): Role of Non-Timber Forest Produce in Village economy. IBRAD, Calcutta.
14. Mallik, R. and Panigrahi, N (1998): Study Report For Nabakrushna Choudhury Center for Development Studies, Odisha, Bhubaneswar.
15. Mallik. R. (1994); Study of some Minor Forest Produce in Orissa: An Empirical Investigation; Study Report for Nabakrushna Choudhury Centre for Development Studies, Orissa.
16. Padhi, G.S. (1994); Forest Resources of Orissa; Rawat Publication, Bhubaneswar.
17. Pattanaik, B.K. and Brahmachari, A. (1996). Community-Based Forest Management Practices: Filed Observations i.om Qrissa; EPW. Vol. XXXI, No.15;
18. Peters, C. et.al., 1989; Valuation of an Amazonian Rain Forest;
19. Risley, H.H. (1891); Bhuinya Tribes and Caste of Bengal. Calcutta.
20. Roy Burman, B. K (1982) Report of the Committee on Forest and Tribal in India, Ministry of Home Affairs, New Delhi.
21. Tiwari, D.D. et.al. (1990); Non-Timber Forest Products and Some Policy Issues and concerns;
22. Weinstock, J.A. 1983. Rattn: Ecological Balance in Borneo Rain Forest. Sweeden, Botanic Gardens, Keed, London.